

NOTES ON SOME UNPUBLISHED LETTERS FROM
FARADAY TO QUETELET.

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IN a recent paper¹ the author incidentally drew attention to the Quetelet MSS. at present in the possession of the descendants of Adolphe Quetelet at Brussels. By the courtesy of M. Georges Quetelet, which it is a pleasure to acknowledge here, the author has been able to examine some items in this collection of letters, which, for the history of science, is perhaps the largest and most important in Belgium. The MSS. left by Quetelet have, however, not yet been systematically indexed². From the correspondence between Faraday and Quetelet only seven letters from Faraday have been found so far, but there is good reason to suppose that there are at least as many others in the unclassified documents. These seven Faraday letters are not unworthy of some notice: and it is hoped that the short analysis with extracts to be given below will prove useful at some future date when Faraday's complete correspondence is published.

Faraday and Quetelet appear to have been on terms of close friendship, as will be evident below from the letter of Sept. 4, 1865. Faraday, it seems, was one of the few among Quetelet's foreign correspondents who did not write in French.

1. *Faraday to Quetelet: Brighton, Dec. 21, 1847.*

Faraday expresses his thanks for his election as an associate member of the *Académie royale de Belgique*.

2. *Faraday to Quetelet: Royal Institution, Dec. 15, 1848.*

Faraday requests Quetelet to forward a letter to Donny (1822-1896). He compliments Quetelet on his activity: "I am astonished to think what industry must be yours". He begins to feel tired himself.

¹ J. Pelseneer, "Quetelet, Chasles et les faux Vrain-Lucas, d'après des lettres inédites", *Deuxième Congrès National des Sciences, Comptes rendus*, Brussels, 1935, vol. i, pp. 105-112. See also J. Pelseneer, "Six lettres inconnues de Berzelius à Quetelet", *Lychnos, Annual of the Swedish History of Science Society*, 1936, pp. 313-315.

² In his 1935 paper the author has criticized (p. 106) the catalogue of "La correspondance scientifique d'Adolphe Quetelet" by A. Collard (*Ciel et Terre*, 1928, pp. 65-74), in which are included (p. 68) five letters from Faraday written between 1865 and 1872, whereas Faraday died in 1867.

(In a letter to Schoenbein written on the same day³, he complains again of failing memory. A letter from Donny to Quetelet on Dec. 24, 1848, mentions the receipt of Faraday's letter.)

3. *Faraday to Quetelet : Royal Institution, Feb. 25, 1850.*

This letter, the text of which is reproduced below, is accompanied by a translation in Quetelet's handwriting from the passage beginning "I have just receiv'd from you . . ." down to ". . . any charge on the ball".

Royal Institution
25 Feb. 1850

My dear friend

I must write you a letter that I may say in it how great pleasure I have had in reading and studying the third part of your Essays on the climate of Belgium ; *i. e.* your results in atmospheric electricity. They are, I think, very admirable ; and I admire the truly philosophic spirit in which you have been content to give them, without any addition of imagination or hypothesis. They are facts⁴ and ought not too hastily to be confounded with opinion ; for the facts are for all time, whilst opinion may change as a cloud in the air. I think, you know, that I cannot adopt Peltier's views of the relation of the Earth & space ; and I was encouraged, therefore, to hold more confidently to my own conclusions in that respect, when I saw how carefully you abstained from any phrase that might commit you to the expression of such an opinion. I took the liberty of giving our members here an account of your results, and they appeared to be most highly interested in them. In doing so I pointed out your philosophic caution, and expressed my opinion that such was the true method by which advances in science in this very difficult part could be really made.

I have just receiv'd from you a few leaves in which I find a letter to you from young M. Peltier. It is quite natural that he should hold to his father's views, but he must remove the fundamental objection before he can make any impression, at least on my mind. That objection is, that it is absolutely impossible to charge any body with an electricity independent of direct relationship with the other electricity. Or in other words that it is absolutely impossible that the earth as

³ *The Letters of Faraday and Schoenbein, 1836-1862*, by G. W. A. Kahlbaum and F. V. Darbshire, Bâle and London, 1899, pp. 182 *et seq.*

⁴ Underlined twice. From the outset of his career, Faraday on all occasions that presented themselves never failed to express his immediate distrust of any scientific tendencies that appeared to him to be too theoretical or speculative. See, for example, his letter of Sept. 12, 1821, to G. de la Rive (S. P. Thompson, *Michael Faraday*, 1898, p. 85). His letter of Feb. 2, 1821, to Ampère shows that his lack of mathematical knowledge was the basis of this attitude : "I regret that my deficiency in mathematical knowledge makes me dull in comprehending these subjects. I am naturally sceptical in the matter of theories and therefore you must not be angry with me for not admitting the one you have advanced immediately" (*Trans. Newcomen Soc.*, 1922-3, 3, 121).

a whole, or any other single body, as a globe, should have negative electricity appearing on its surface or be *driven into its interior* merely by variation in the electric intensity of the whole surrounding space. If an insulated ball of metal or earth be suspended within a much larger sphere of metal, or wire gauze or any thing else (to represent the space action), which can be charged simultaneously in all parts, no amount of charge which can be given to the sphere representing space, can induce any charge on the ball ; nor would the discharge of that space electricity induce any charge on the ball :—and further ; that representation of space could not exert any inducing action inwards ;—nor could it receive charge, unless it could induce equivalently to something external & outside of itself ;—and even in so doing would show no sign of action inwards.

I have carefully considered all the reasonings and views which Peltier has put forth that seem to bear upon or touch this point ; but with the best judgment I could [arrive at] exercise have come to the conclusion that none of them do really touch it.

Ever My dear Sir
Your Very obliged & faithful
M FARADAY

A Mons Quetelet

4. *Quetelet to Faraday : Sept. 9, 1850.*

This letter has been published by Bence Jones⁵. Quetelet is sending to Faraday the Diploma of the Associateship of the Academy and also his portrait.

5. *Faraday to Quetelet : Royal Institution, Nov. 23, 1850.*

A French version, almost certainly by Quetelet, of the greater part of this letter, from the words “I am vain enough to think . . .” down to “You will hear more about them soon”, has been already published elsewhere (*Bull. Acad. Roy. de Belgique*, 1850, 17 (ii), 371–2 ; and *Annuaire de l'Observatoire royal de Bruxelles*, 1851, pp. 391–2).

Royal Institution
23 November

My dear Sir

I ought long ago to have returned you my heartiest thanks for your very great kindness in sending the Portrait I so much desired for my book. It forms a great addition to the pleasure I take in looking into the volume. The only excuse I have is that I have been deeply occupied and I hope that the subject of my thoughts will be acceptable to you. I am vain enough to think that I have found the true physical cause for the periodical & many of the irregular variations of the

⁵ *Life and Letters of Faraday*, London, 1870, vol. ii, pp. 268–9.

magnetic needle⁶ and perhaps even in part for the magnetic storms. You remember that three years ago I made known the magnetic characters of oxygen in a letter in the Philosophical magazine devoted to the diamagnetic condition of flame & gases⁷ and spoke generally of its effect in the atmosphere⁸. Since then I have continually thought & worked on the subject & of late have devised experimental means of ascertaining the effects of rarefaction and of temperature separately in relation to the different gases⁹. I find that all the effects of these two modes of change are exerted on the oxygen & none on the nitrogen. That if oxygen is rarefied by the air pump it loses in magnetic power in proportion, that if it is heated it loses in proportion, but that in regard to the nitrogen neither rarefaction nor change of temperature produces any effect—Then by a chain of reasoning which is given in the three papers that I have sent in to the Royal Society supported by facts drawn from other bodies than oxygen & nitrogen I deduce the effect which the daily changes of temperature ought to produce upon the direction of the lines of force of the earth & as far as I have been able to compare the conclusions with the results obtained at Hobartton, Toronto, Washington, Lake Alhabasen, Fort Simpson, Greenwich, St Petersburgh, Cape of Good Hope, St Helena and Singapore¹⁰ the one accords with the other. You will hear more about them soon.

You desire me to send you a copy of the last portrait that was taken of myself and I shall do so on the first occasion that I can find conveyance perhaps by the Royal Society when the papers are printed. Believe it to represent one who has the highest feelings for your character as a Gentleman a Philosopher and a kind friend

Ever My dear Sir
Most Truly Yours
M FARADAY.

*A Monsieur
Mons Quetelet.*

6. *Faraday to Quetelet : Royal Institution, April 19, 1854 (sic).*

The original bears the date 1854, but it should certainly be 1851. There are two letters of the same date from Faraday, one to Schoenbein (see *The Letters of Faraday and Schoenbein*, pp. 195 *et seq.*) and the other to Tyndall (see *The Life and Letters of Faraday*, vol. ii, pp. 294 *et seq.*), both correctly dated from Hastings, and revealing the remarkable failure in Faraday's memory.

⁶ A later letter to de la Rive (Feb. 4, 1851) expresses the same hope in the same words (Bence Jones, *op. cit.*, vol. ii, pp. 260–1).

⁷ "On the Diamagnetic Conditions of Flame and Gases" (*Phil. Mag.*, 1847, **31** (iii), 401).

⁸ In two letters to Schoenbein written on Nov. 19 and Dec. 9, Faraday also mentions this subject. Cf. *Letters of Faraday and Schoenbein etc.*, pp. 186 *et seq.*

⁹ Cf. *Faraday's Diary*, London, 1934, vol. v, for the months preceding November 1851.

¹⁰ In the letter of Nov. 19, 1850, to Schoenbein, eight only of these ten stations are mentioned (see *The Letters of Faraday and Schoenbein*, p. 187).

Royal Institution
19 April 1854

My dear Quetelet

Directly that I received your letter I translated it and sent it to the Philosophical Magazine where I have no doubt you have seen its insertion¹¹ and I trust it will induce some to join with you in the observation of atmospheric electricity. Your observations regarding the first part of the year 1849 are most interesting and I have full confidence in them so that though it may in some degree (& a large one) be unfortunate that there are not other observations made elsewhere to compare with yours still it is of the utmost consequence that yours have been made & I hope they will awake the sleepy observers.

You flatter me by the manner in which you receive my portrait. I do not think much of my own face but I have very great pleasure in looking upon yours and it brings by association all your kind feelings towards me back to my mind and very pleasant they are.

I have sent you a long paper or rather several papers a little while ago—certain were on atmospheric magnetism I have no fear as to the experimental part & I entertain hopes that the hypothetical part may find favour before your philosophic mind. My hopes in it are not as yet any less than at any former time—but I shall leave the paper to tell its own story.

I am not quite right in health and though I have from habit dated from the Royal Institution am really at Hastings on the Seashore waiting on rest & fresh air

Ever My dear M. Quetelet
Your faithful Servant
M FARADAY

7. *Faraday to Quetelet : Royal Institution, Aug. 6, 1860.*

Royal Institution
6 August 1860

My dear Mr Quetelet

Your letter gave me great pleasure containing as it did so agreeable a mark of your remembrance. I heard you had been in London and at one moment hoped to meet you at Miss Couth but could not get there—Just as I learned that you were at the house of M. Van der Weyer¹² & was preparing at all event to leave a card for you, you were gone. I know how much your hours would be in request at the beginning of things, & I hope they were not shortened here by any cause of anxiety at home. May you be happy there, in that in that [sic] indeed which makes the true and real part of life.

I thank you very much for the many kind scientific remembrances which you send me—proving as they do your active & powerful exertions

¹¹ Cf. *Phil. Mag.*, 1851, 1 (iv), 329–32. (On Atmospheric Electricity, especially in 1849, by M. Quetelet. Extract of a letter from M. Quetelet to M. Faraday, dated March 20, 1851).

¹² Sylvain Van de Weyer, at this time Belgian Minister at London, who had been since 1840 Quetelet's colleague in the *Académie royale de Belgique*.

in the cause of science. I have little or nothing to send you in return—only a short note on regelation¹³ which this part will bring you—all things wear out and philosophers amongst the rest, and for my part I think it best that we should learn this before & be content & happy in our latter years, in possession of the many blessings that are granted to an humble & satisfied mind

Ever my dear friend
Very Truly Yours
M FARADAY

8. *Quetelet to Faraday* : Mar. (or May ?) 3, 1862.

A rough draft. Quetelet has suffered several bereavements. The letter (lost ?) written to him by Faraday is among those that have given him the greatest consolation. In these sad circumstances, adds Quetelet :

“ J'ai du beaucoup aussi au bon, à l'excellent prince Albert, qui, l'année dernière encore, m'a écrit successivement trois lettres dans lesquelles il me témoignait les sentiments les [meilleurs] plus affectueux. Vous avez connu cet excellent Prince, vous devez savoir combien il y avait en lui de bonté et d'affection. Je le pleure encore, comme on pleurerait un fils pardonnez moi cette expression ; mais le prince m'avait autorisé à le regarder comme ce que j'avais de plus cher au monde. D'ailleurs je vous parle ainsi de lui parce que je sais l'estime qu'il vous portait. jamais ensuite ses lettres si bonnes, si amicales ne sont sorties de mes mains, et n'ont même été communiquées à des amis.”

This interesting passage is reproduced here, because it was not known to Ernest Gossart when he published his excellent study on *Adolphe Quetelet et le prince Albert de Saxe-Coburg (1836–1861)*¹⁴.

9. *Quetelet to Faraday* : Aug. 1, 1865.

An official letter announcing the sending of some publications.

10. *Faraday to Quetelet* : London, Sept. 4, 1865.

This is perhaps the last letter written entirely in Faraday's own hand. “ My dear dear friend ”, “ dear Quetelet ”, “ your faithful friend ”. Thanks. Faraday regrets that he has missed Melsens on his visit. He complains of his declining faculties.

The author expresses his thanks to Dr. D. McKie for his kind assistance in the translation of this paper into English.

¹³ “ Note on Regelation ” (*Proc. Roy. Soc.*, 1859–60, **10**, 440). Read on April 26, 1860. Faraday's final contribution to the Royal Society.

¹⁴ *Acad. roy. de Belg., Bull. de la Classe des Lettres*, 1919 ; pp. 211–254.